Acute Limb Ischemia: Very Different from Chronic Critical Limb Ischemia

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## Definitions

<table>
<thead>
<tr>
<th>Acute Limb Ischemia (ALI)</th>
<th>Chronic Critical Limb Ischemia (CLI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Sudden decrease or absence of perfusion in a limb</td>
<td>• &gt; 2 weeks duration</td>
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<tr>
<td>• Pain</td>
<td>• Ischemic rest pain or</td>
</tr>
<tr>
<td>• Pallor</td>
<td>• wounds or</td>
</tr>
<tr>
<td>• Pulselessness</td>
<td>• gangrene</td>
</tr>
<tr>
<td>• Paralysis</td>
<td>• due to PAD</td>
</tr>
<tr>
<td>• Polar temperature</td>
<td></td>
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</tbody>
</table>

**Chronic Critical Limb Ischemia (CLI)**

- > 2 weeks duration
- Ischemic rest pain or
- wounds or
- gangrene
- due to PAD
## Further definitions of CLI

<table>
<thead>
<tr>
<th>Hemodynamic parameters defining Critical Limb Ischemia</th>
<th>Absolute ankle pressure</th>
<th>Absolute great toe pressure</th>
<th>Transcutaneous partial oxygen pressure (TCPO&lt;sub&gt;2&lt;/sub&gt;)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Absolute ankle pressure</strong></td>
<td>&lt;50 mmHg or &lt;70 mmHg</td>
<td>Plus rest pain</td>
<td>Estimation of wound healing, considerable variability</td>
</tr>
<tr>
<td><strong>Absolute great toe pressure</strong></td>
<td>&lt;30 mmHg</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Transcutaneous partial oxygen pressure (TCPO&lt;sub&gt;2&lt;/sub&gt;)</strong></td>
<td>&lt;30 mmHg</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Plus ischemic lesion(s)*

*Plus* if non-compressible ABI (>1.40)

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Eur Heart J. 2011;32(22):2851-906
Etiologies

ALI

- Trauma
- Iatrogenic
- Graft or angioplasty occlusion
- Popliteal aneurysm thrombosis
- Other:
  - Aortic dissection
  - Plegmasia cerulea
  - Ergotism
  - Drug use

Thrombosis 41%
Embolism 38%
Graft or angioplasty occlusion 15%
Popliteal aneurysm thrombosis 3%
Trauma 2%
Iatrogenic 1%

CLI

- Progressive Atherosclerotic Calcific PAD

Other:
- Aortic dissection
- Plegmasia cerulea
- Ergotism
- Drug use

TASC II. Eur J Vasc Endovasc Surg. 2007;33 Suppl 1:S1-75
Incidence

ALI
- 14 to 26 per 100,000/yr
- ~ 15% of LE-PAD cases

CLI
- 50 to 100 per 100,000/yr

J Vasc Surg. 2014;60(3):669-77.e2
Eur Heart J. 2011;32(22):2851-906
Treatment – ALI

Acute limb ischaemia

Viable
- Heparin
- Work-up
  - Risk evaluation
- Semi-urgent
  - Imaging technique

Limb Threatening
- Heparin
- Emergent
  - Imaging technique
- Decision making

Irreversible
- Amputation*

Catheter directed Thrombolysis–thrombectomy

Feasible—proceed

Unfeasible

Underlying lesion

No

Endovascular revascularization

Feasible—proceed

Unfeasible

Open revascularization

Yes

Feasible—proceed

Unfeasible

Medical Treatment

* Sometimes, differentiation between a salvageable and unsalvageable extremity is almost impossible. If the doubt is raised, any surgical or endovascular revascularization action is justified even in advanced profound ischaemia.
Treatment – ALI

• Catheter-directed or pharmacomechanical fibrinolysis
• Surgery

Ann Surg. 1994; 220: 251–266
Treatment – CLI

Management of critical limb ischaemia

- Rest pains
  - Pain control (morphine)
  - Urgent revascularization
- Ischaemic lesion, gangrene
  - Pain control (morphine), wound care, treatment of infection (antibiotics)

Feasible
- Endovascular revascularization
  - Technical failure, endovascular revascularization unsuitable
  - Surgical revascularization

Unfeasible
- (Endovascular or surgical)
  - Re-do procedure

Favourable
- Control CVD risk factors, debridement, shoe adaptation (removal of weight-bearing stress to lesion), surveillance

Unfavourable
- Control CVD risk factors, pain control (morphine), wound care
  - Prostaglandins, consider spinal cord stimulation
  - Amputation, rehabilitation

Eur Heart J. 2011;32(22):2851-906
Treatment – CLI

- Multidisciplinary Amputation Prevention Team

- Restoration of perfusion
  - Endovascular vs. Surgical
  - Angiosome-directed

- Endovascular advantages
  - low complication rates, 0.5% to 4.0%
  - high technical success rates ~ 90

- Aggressive Wound Care

Eur Heart J. 2011;32(22):2851-906
Outcomes

**ALI**

ALI Outcomes (%)
U.S. Medicare population 1998-2009

- Amputation: 6.4
- Mortality: 11
- 1-year: 9

**CLI**

- 6-month outcomes (pooled, 19 studies)

- Dead 20%
- Alive with amputation 35%
- Alive without amputation 45%

References:

- J Vasc Surg. 2014 Sep;60(3):669-77
Long-term medical therapy

- Adherence to guideline-recommended medical therapies
  - ASA
  - Statin
  - ACEI/ARB
  - Smoking cessation

(Retrospective, single-center, N = 1091)
Long-term medical therapy

- Cilostazol

Thank you
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